REMARKS

Claims 1 and 3-7 are pending in the application. Claims 1, 3, 4, 6 and 7 were rejected under 35 U.S.C. §103(a) as being unpatentable over Berman in view of Black et al. Claim 5 was rejected under 35 U.S.C. §103(a) as being unpatentable over Berman in view of Black, and further in view of Coffey. Reconsideration and reexamination of the application in view of the following remarks is respectfully requested.

Claims 1, 3, 4, 6 and 7 were rejected under 35 U.S.C. §103(a) as being unpatentable over Berman in view of Black. This rejection is respectfully traversed.

The Office Action basically states that Berman discloses most, but not all of the limitations recited in the claims, and that Black discloses those limitations missing from Berman. The Office Action then goes on to state that one skilled in the art would have been motivated to modify the teachings of Berman with the teachings of Black to come up with the claimed invention. In particular, the Office Action states:

> [I]t would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the fiber [sic] channel arbitration method and apparatus of Berman with the teaching of Black in creating a direct path connection between two ports based on OPN primitives such that FC_AL system and method Berman [sic] will create the direct paths between the ports based on the OPN arbitrated loop primitives.
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> The motivation to do so is to use OPN primitives, instead of the frame of data to find the destination node, to deduce the location of destination node and cut out all subloops and nodes thereon that are not necessary for communication between the source and destination nodes thereby decreasing unnecessary delay in completing each loop tenancy and increasing bandwidth.

However, it is respectfully submitted that the Office Action does not sufficiently appreciate the differences between the present invention, Berman, and Black, and that it would not have been obvious at all to one skilled in the art to combine the teachings of Berman and Black to come up with the invention as claimed.

An introduction to switches is first presented to help explain these differences. There are two fundamentally different types of routers or switches in Fibre Channel (FC). Primitive-based routers or switches establish routing based on primitives, while frame-based routers or switches establish routing based on frames. "Frame switches" and "primitive switches" target two different markets and two different places within a network. Frame switches are generally located *between* storage systems and servers, and provide extra functionality (e.g. buffers and the like) to enable the connection of multiple devices. In contrast, primitive switches are generally located *within* a storage system, and as a result do not have frame-switching hardware or the extra functionality needed to enable the connection of multiple devices, but are generally much less expensive than frame switches. In summary, frame switches and primitive switches are non-overlapping in that they are located at distinctly different places in a network, serve two distinctly different purposes, and have distinctly different architectures.

Berman is a *frame switch*, and as such, is intended for use between storage systems and servers, provides the extra functionality needed to enable the connection of multiple devices, and discloses frame-based features for switching based on frames.[1] On the other had, the claimed invention is a *primitive switch* intended for use within storage systems that supports only the Fibre Channel Arbitrated Loop (FC_AL) topology, does not include the extra functionality of Berman, but is more cost-effective than Berman.

The Office Action ignores the fundamental differences between a frame switch and a primitive switch and first attempts to improperly associate various features disclosed in Berman with limitations in the claims. For example, the Office Action states that the claim 1 limitation "said first

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[1] The only place in Berman that primitive-based routing is discussed is in the context of an "intelligent bridging hub" in col. 14, lines 48-58. However, those lines indicate that the intelligent bridging hub needs to be aware of *frames* to perform its function. Specifically, col 14, lines 46-47 of Berman states that the hub needs minimum processor functions to 'spoof' the PLOGI I/O (a frame type) probes and participate in loop initialization. (It is well-understood that loop initialization is performed utilizing a standard defined loop port state machine (LPSM), which transforms the hub into an active port that can terminate the loop protocol and source frames.) Furthermore, col. 14 line 53 of Berman discloses "a processor 762 to perform loop initialization and some other stealth features." Loop initialization indicates an active L_Port (i.e. LPSM) as mentioned above, and "other stealth features" suggests frame level behaviors, as supported by the text of Berman.

and second ports including port logic to monitor Open (OPN) arbitrated loop primitives" is taught by Berman's port control modules (PCMs) which include port logic to monitor arbitrated loop primitives, and references col. 20 lines 27-59 of Berman (claim 1 of Berman) in support. However, in direct contradiction to the Office Action's assertion, the PCMs in Berman do not monitor primitives. Nowhere in col. 20 lines 27-59 of Berman, and indeed nowhere in the entirety of Berman, are PCMs for monitoring primitives disclosed, taught or suggested. Moreover, the port logic of Berman teaches away from monitoring and routing based on primitives, because the port logic includes buffers, an active loop port state machine that *terminates primitives*, and a routing scheme based on different parts of the frame. In other words, the port logic of Berman would have to be nearly completely modified to support routing based on primitives.

The Office Action admits that the limitation that "wherein the crossbar switch creates direct paths between the first and second ports based on the OPN arbitrated loop primitives" is not disclosed in Berman. However, the Office Action goes on to state that Black discloses routing based on FC_AL OPN primitives to create direct paths between ports, and that one skilled in the art would have been motivated to "modify the fiber channel arbitration method of Berman with the teaching of Black in creating a direct path connection between two ports based on the OPN primitives.

This line of reasoning is flawed, and fails to take into account the fundamental differences between a frame switch (Berman) and a primitive switch (Black) as described above. When the differences between Berman and Black are properly understood, it becomes clear that one of ordinary skill in the art would not have been motivated to combine them because of the fundamental differences in the two routing systems.

The route determination apparatus in Berman is described as a frame level route determination apparatus that acts upon the OPN frames, routes based on the D_ID, and cannot be trivially modified to route based on primitives (see, e.g., col. 11 lines 10-16, col. 13 lines 7-12 and col. 14 lines 27-31 of Berman). The port control is described as having buffering, which cannot be used to buffer OPN primitives (see col. 14 lines 23-31 and FIG. 17), and an active loop port

(L_Port) state machine that terminates protocols (see col. 14 lines 19-20 and FIG. 17). Claim 1 of Berman (col. 20 lines 43-46) explicitly discloses a FC_AL port state machine implementing the FC_AL protocol, including ARBs, OPNs and Closes, the state machine including and active L_Port, which is well-understood in accordance with the FC_AL standard as a device that terminates the sequence-level protocol. All of this is specifically designed for a frame level switch and not a primitive layer switch.

Because of these features that are specific to frame switches, it is not possible to trivially convert Berman from a frame switch to a primitive switch, or to take one teaching of the primitive switch in Black and utilize it with the teachings of Berman. In fact, most of the architecture in Berman would have to be discarded and re-designed to accommodate primitive switching. In particular, to modify Berman to support routing based on primitives, the router would have to be changed to look at primitives instead of frames, the port logic would have to be changed to eliminate the buffering, and the loop port state machine would have to be discarded because it terminate primitives. Because of this fundamental incompatibility, and because frame switches and primitive switches are located at distinctly different places in a network and serve two distinctly different purposes, one skilled in the art would not have been motivated to combine the teachings of Berman with the teachings of Black.

The Office Action merely states that it would have been obvious to combine the teachings of Berman and Black, and neglects to address their fundamental incompatibilities. The Office Action states a motivation to combine the references, but fails to address the numerous offsetting de-motivations created by their incompatibilities as described above.

A general desire to expand operational capabilities does not in any way provide the necessary motivation to modify Berman in the manner which would be necessary to result in the present invention. See, e.g., *In re Kotzab*, 54 USPQ 2d 1308 (Fed. Cir. 2000). It would not have been obvious to perform a major modification to Berman based simply upon some general desire to expand the operational capabilities of the system. Such a modification is based entirely on the hindsight provided by the present invention. See, e.g., *A1-Site Corp. v. VSI International , Inc.*, 50

USPQ 2d 1161 (Fed. Cir. 1999) ("The invention must be viewed not with the blueprint drawn by the inventor, but in the state of the art that existed at the time.")

Accordingly, because one skilled in the art would not have been motivated to combine the teachings of Berman with the teachings of Black, it is respectfully submitted that the rejection of claims 1, 3, 4, 6 and 7 under 35 U.S.C. §103(a) as being unpatentable over Berman in view of Black has been traversed.

Claim 5 was rejected under 35 U.S.C. §103(a) as being unpatentable over Berman in view of Black, and further in view of Coffey. This rejection is also respectfully traversed.

As discussed above, one skilled in the art would not have been motivated to combine the teachings of Berman with the teachings of Black. Because Berman and Black cannot be combined, the three references cannot be combined, and it is respectfully submitted that the rejection of claim 5 under 35 U.S.C. §103(a) as being unpatentable over Berman in view of Black and further in view of Coffey has been traversed.

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

If, for any reason, the Examiner finds the application other than in condition for allowance, Applicants request that the Examiner contact the undersigned attorney at the Los Angeles telephone number (213) 892-5752 to discuss any steps necessary to place the application in condition for allowance.

In the unlikely event that the transmittal letter is separated from this document and the Patent Office determines that an extension and/or other relief is required, Applicants petition for any required relief including extensions of time and authorizes the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to **Deposit Account No. 03-1952** referencing Docket No. 491442011620.

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Respectfully submitted,

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